REMARKS

Claims 4, 6, 8, 10, 12, 14-17, 24, and 35-40 are now pending in the application. Claims 4, 6, 8, 10, 12, 14, 16, and 24 have been rewritten in independent form and thus present no new issues for consideration by the Examiner. Applicant requests these amendments be entered at this time. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTIONS UNDER 35 U.S.C. § 102 AND § 103

Claim 1 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Chang (U.S. Pat. Pub. No. 2004/0208587 A1; "Chang"). Claim 1 has been canceled from the application, thereby rendering this rejection moot.

Claim 4 stands rejected under 35 U.S.C. §102(e) as being anticipated by Chang. This rejection is respectfully traversed.

In Claim 4, when an optical path is a bi-directional optical path, the optical node device decides which optical node device implements 3R relay in both a downstream optical path and an upstream optical path.

With such a feature, it is possible to decide which optical node device implements 3R relay in both the upstream and downstream directions at the time that a bi-directional path setting is signaled. Therefore, optical signals can be transmitted immediately after signaling completion, and thus it is possible to set optical paths promptly (page 6, third paragraph of the specification).

In contrast, the Examiner provides the assertion as described on page 3, second paragraph, of the Office Action.

However, FIG. 2 of Chang merely illustrates two different optical paths A and B, and fails to explicitly disclose a bi-directional path. In addition, FIG. 2 of Chang merely relates to the conventional art of Chang, and it is irrelevant to the embodiments of Chang such as FIGS. 6A and 6B pointed out by the Examiner with respect to current independent Claim 1. Therefore, even if FIG. 2 of Chang suggested a bi-directional path (with which the Applicant respectfully disagrees), Chang neither discloses nor suggests that the determination on the necessity of signal regeneration for a bi-directional path is made in the embodiments of Chang. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claims 6, 8, 10, and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chang. This rejection is respectfully traversed.

With respect to Claim 6 as well as Claims 8, 10, 12, 14, and 16 discussed later, the Examiner provides the same assertion as described in Item 4 of the Office Action.

In Claim 6, when one optical node device is a 3R source node of any one of 3R sections and is not a 3R source node and a 3R destination node of other 3R sections, the one optical node device refers to 3R section information related to an optical path from the one optical node device to a destination node, and when the number of 3R implementations when the one optical node device functions as a 3R source node is less than the number of 3R implementations when the one optical node device does not

function as a 3R source node, the one optical node device itself decides that the one optical node device implements 3R relay.

With such a feature, since an optical signal can be transmitted by the minimum number of 3R relay operations possible, it is possible to use network resources effectively using the minimum number of, or minimum capability of, 3R repeaters necessary, and configure economical optical networks (page 7, first paragraph, of the specification).

In contrast, even referring to the disclosure of Chang pointed out by the Examiner, Chang neither discloses nor suggests the technical ideas that: the number of times of signal regeneration is determined for both the case in which signal generation is performed in a given node and the case in which signal generation is not performed in the given node; the number of times of signal regeneration is involved in an optical path from the given node to a destination node; and whether or not signal regeneration is to be performed in the given node is determined based on the comparison of the number of times of signal regeneration.

Moreover, even if signal regeneration is performed at a node that is furthest from a given node among nodes that are reachable from the given node as shown in FIG. 7 of Chang, the number of times of signal regeneration is not necessarily minimized. Specifically, as explained in the specification of the present application (page 67, last paragraph, to page 68, first paragraph), the capacity (optical signal intensity) of light emission elements of respective optical node devices and the capacity (light receiving sensitivity) of light receiving elements of the respective optical node devices are not necessarily identical to each other. For example, when the capacity of node C which is

furthest from node A among nodes that are reachable from node A is considerably small, and the capacity of node B positioned between node A and node C is considerably large, node E that is reachable from node B is further (i.e., closer to a destination node) than node D that is reachable from node C. Therefore, the number of times of 3R relay implementations of the invention as recited in Claim 6 can be smaller than the number of times of signal regeneration of Chang. In other words, the number of times of 3R relay implementations of the invention as recited in Claim 6 does not exceed the number of times of signal regeneration of Chang. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 8

In Claim 8, when one optical node device is a 3R destination node and is not a destination node, the one optical node device decides that the one optical node device implements 3R relay by using the one optical node device as a 3R source node and the next hop optical node device as a 3R destination node.

With such a feature, even if the one optical node device, which is a 3R destination node, does not store 3R section information ahead of the one optical node device itself, it is possible to realize 3R relay transmission without delay (page 7, third paragraph, of the specification).

In this way, the invention as recited in Claim 8 decides to perform 3R relay from the one optical node device itself to the next hop node device based on the condition that the one optical node device is a 3R destination node and is not a destination node.

Thus, the invention as recited in Claim 8 is different from Chang, which decides the necessity of performing signal generation based on the reachability of optical signals.

In addition, as can be understood from the recitation of Claim 8, the invention as recited in Claim 8 generates 3R section information anew. In contrast, Change neither expands a photonic cell nor generates a new photonic cell.

Moreover, Chang stores information of all the photonic cells in one centralized location (a centralized database) other than nodes (paragraphs [0038] and [0039] of Chang) or stores the information in all the nodes (paragraph [0041] of Chang). Therefore, it is impossible for Chang to provide the foregoing advantageous effects of the invention as recited in Claim 8 while autonomously determining the necessity of implementing 3R relay. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 10

In Claim 10, when one optical node device does not belong to any one of 3R sections having a 3R source node on an optical path that passes through the one optical node device, the one optical node device decides that the one optical node device implements 3R relay by using the one optical node device as a 3R source node and the next hop optical node device as a 3R destination node.

With such a feature, even if the optical node device is not included in any one of the pieces of existing 3R section information, it is possible for the optical node device to implement 3R relay without delay. In addition, 3R section information for all of the sections of an optical network does not need to be stored, and 3R section information

must only be stored for key places, and thus it is possible to store 3R section information efficiently (page 8, second paragraph, of the specification).

Regarding FIGS. 6A and 6B of Chang, even if node *n* itself determined the necessity of performing signal regeneration as asserted by the Examiner with respect to Claim 1, Chang neither discloses nor suggests the technical idea of determining that node *n* itself performs signal regeneration based on the criterion that node *n* does not belong to any photonic cells. That is, in FIGS. 6A and 6B of Chang, determination is made based on the criterion of whether or not the previous node *m* and the next node *p* belong to the same photonic cell, and thus information about node *n* itself is not used.

Regarding FIG. 7 of Chang, it is determined that a node which is furthest from a given node among nodes that are reachable from the given node performs signal regeneration. Any nodes which do not belong to the photonic cell to which the given node and the furthest node belong are not involved in this determination. Therefore, Chang neither discloses nor suggests the feature of Claim 10.

In addition, similar to Claim 8, the invention as recited in Claim 10 generates 3R section information anew. Therefore, the foregoing arguments related to Claim 8 can apply to Claim 10.

Moreover, as discussed with respect to Claim 8, since Chang stores information of all the photonic cells in one centralized location or in all the nodes, it is impossible for Chang to provide the foregoing advantageous effects of the invention as recited in Claim 10 (e.g., 3R section information need only be stored for key places) while autonomously determining the necessity of implementing 3R relay. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 12

In Claim 12, when one optical node device is a 3R source node in an upstream optical path and is not a destination node and a 3R destination node in the upstream optical path, a message is transmitted so as to transmit to a previous hop optical node device in the upstream optical path information that the previous hop optical node device is a 3R source node which uses the one optical node device as a 3R destination node. In addition, when the optical node device itself receives the message in the upstream optical path, the optical node device decides that the optical node device itself is a 3R source node in the upstream optical path with an optical node device which has sent the message as a 3R destination node.

With such a feature, 3R section information for all of the sections of an optical network does not need to be stored, and 3R section information must only be stored for key places, and thus it is possible to store 3R section information efficiently (page 8, second paragraph, of the specification).

In contrast, Chang does not even mention upstream optical paths. Moreover, regarding FIGS. 6A and 6B of Chang, even if node *n* itself determined the necessity of performing signal regeneration as asserted by the Examiner with respect to Claim 1, since node *n* is not a 3R source node before the determination has been made, the limitation of Claim 12 that "one optical node device is a 3R source node and is not a destination node and a 3R destination node" is not met. Furthermore, FIGS. 6A and 6B of Chang neither disclose nor suggest that the next hop node *n* determines that signal regeneration is to be performed in the previous hop node *m*. This is also the case for FIG. 7 of Chang which determines that signal regeneration is to be performed in a node

which is furthest from a given node among nodes that are reachable from the given node. Furthermore, Chang fails to even mention the transmission of messages between nodes, let alone the aforementioned operation of the invention as recited in Claim 12 related to messages.

In addition, similar to Claim 8, the invention as recited in Claim 12 generates 3R section information anew. Therefore, the foregoing arguments related to Claim 8 can apply to Claim 12.

Moreover, as discussed with respect to Claim 10, it is impossible for Chang to provide the foregoing advantageous effects of the invention as recited in Claim 12 (e.g., 3R section information need only be stored for key places) while autonomously determining the necessity of performing implementing 3R relay. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 14

In Claim 14, upon receipt of a message indicating that the optical node device is a 3R destination node, when the optical node device itself is not a destination node and is a 3R source node, the optical node device itself determines that the optical node device itself implements 3R relay. In addition, the optical node device transmits a message to an optical node device corresponding to a 3R destination node of a 3R section in which the optical node device itself is a 3R source node so as to transmit that the optical node device corresponding to the 3R destination node is a 3R destination node.

With such a feature, it is not necessary to store 3R section information that is not related to the optical node device itself, and thus it is possible to use information storage resources effectively (page 8, fourth paragraph, of the specification).

In contrast, as discussed above, Chang fails to even mention the transmission of messages between nodes. Therefore, Chang neither discloses nor suggests the technical ideas of: determining the signal generation implementation upon receipt of a message; and transmitting a message to another node, let alone the aforementioned operation of the invention as recited in Claim 14 related to messages.

Moreover, as discussed with respect to Claim 10, it is impossible for Chang to provide the foregoing advantageous effects of the invention as recited in Claim 14 while autonomously determining the necessity of implementing 3R relay. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 16

In Claim 16, upon receipt of a message indicating that the optical node device is a 3R destination node in the downstream optical path, when the optical node device itself is not a destination node and is a 3R source node in the downstream optical path, the optical node device itself determines that the optical node device itself implements 3R relay. Moreover, the optical node device transmits a message to an optical node device corresponding to a 3R destination node of a 3R section in the downstream optical path in which the optical node device itself is a 3R source node so as to transmit that the optical node device corresponding to the 3R destination node is a 3R destination node. In addition, upon receipt of a message indicating that the optical node

device is a 3R source node in the upstream optical path, the optical node device itself determines that the optical node device itself implements 3R relay in the upstream optical path. Moreover, when the optical node device itself is not a destination node and is a 3R destination node in the upstream optical path, the optical node device itself transmits a message to an optical node device corresponding to a 3R source node in the upstream optical path in which the optical node device itself is a 3R destination node so as to transmit that the optical node device corresponding to the 3R source node is a 3R source node.

With such a feature, it is not necessary to store 3R section information which is not related to the optical node device itself, and thus it is possible to set an optical node device that implements 3R relay in a bi-directional optical path while using information storage resources effectively (page 10, second paragraph, of the specification).

In contrast, as discussed above, Chang fails to even mention the transmission of messages between nodes. Therefore, Chang neither discloses nor suggests the technical ideas of: determining the signal generation implementation upon receipt of a message; and transmitting a message to another node. In addition, Chang does not even mention upstream optical paths, let alone the aforementioned operations of the invention as recited in Claim 16 related to messages for the downstream optical path and the upstream optical path.

Moreover, as discussed with respect to Claim 10, it is impossible for Chang to provide the foregoing advantageous effects of the invention as recited in Claim 16 while autonomously determining the necessity of implementing 3R relay. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

ALLOWABLE SUBJECT MATTER

The Examiner states that claims 24 and 35-40 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Dependent Claim 24, which is directly dependent on Claim 1, has been rewritten into independent form by incorporating the limitations recited in Claim 1. Accordingly, Claims 24 and 35-40, which are dependent on Claim 24, should be in condition for allowance.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested.

If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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